

REMARKS

Claim Rejections - 35 U.S.C. 103

Original claims 1-14 were rejected under 35 U.S.C. 103 as being unpatentable over Parker (U.S. 3,457,163) in view of Lee et al. (U.S. 6,551,502).

Before discussing the details of the references, Applicants respectfully point out that the present invention demonstrates that several advantages are obtained by subjecting an FCC gasoline and the like to a hydrogenation step prior to an extractive distillation step. This is born out by a review of Examples 1 and 2 of the present application as well as from the sentence on page 10, line 5 which indicates that in the generation of the solvent, a stream can be obtained which contains 60-90% by weight of aromatics which can then be subjected to a hydrodesulfurization step, so as to obtain a stream depleted in sulfur-containing impurities but rich in aromatics. Also, the use of a hydrogenation step results in a product from the extractive distillation step which has a lower content of sulfur and dienes and substantially the same content of olefins as compared to the same process wherein an FCC gasoline is passed directly to an extractive distillation step (comparative Example 1).

Applicants have carefully studied the cited Parker and Lee references and are of the respectful conclusion that they do not realistically suggest the present invention. In support of this contention, the following references are explained as follows:

Lee et al. U.S. 6,551,502

Although this reference is used in a secondary manner in the Office Action, it should be used as the primary reference since it shows the step of extractive distillation of an FCC gasoline and also a follow up hydrotreatment of a sulfur-rich extract from the extractive distillation. The hydrotreated extract can then be subjected to hydrodesulfurization in order to produce another stream of reduced-sulfur gasoline which can be combined with the sulfur-reduced raffinate from the extractive distillation step. Thus, this reference teaches one of ordinary skill of the art the benefits of utilizing extractive distillation for the desulfurization of an FCC stream, and then a follow up hydrodesulfurization step of the extract rich in sulfur-containing impurities. Clearly,

there is no suggestion of utilizing a hydrogenation step prior to the extractive distillation step, as conducted in Applicants' process, much less the benefits that are achieved.

Parker U.S. 3,457,163

This reference is directed to the problem of eliminating the gum-forming components of pyrolysis gasolines. In general, pyrolysis gasolines have a much higher content of gum-forming components which must be eliminated so that the gasoline can be treated in subsequent steps. In comparison, an FCC gasoline has generally much lower concentrations of dienes which would not justify a separate step for moving same. The patent to Lee et al., discussed above, indeed demonstrates the lack of a need for such a separate step. Thus, a refinery engineer of ordinary skill would not find it obvious to use any of the teachings of Parker for the purposes of modifying the Lee et al. process.

Furthermore, it is seen that essential steps of Parker include the removal of gum-like compounds. Referring to the flowsheet in Parker, it is seen that separator 15 is used to remove the gum-like compounds from both the feedstock and the separator 15. (Gum-like compounds are produced in the reactor and recycled back to separator 15.) Applicants' process is much less complicated and is reflected in new claims 22 and 23 wherein in claim 22 the hydrogenated fraction is passed directly into the extraction step without using separators such as those employed in Parker, or for the purpose of removing gum-like compounds or precursors thereof. As for claim 23, in particular, in Applicants' process, the feedstock is passed directly into the hydrogenation stage, without having to traverse a separation stage for the removal of gum-like compounds. This is another reason why a refinery engineer would be dissuaded from using the complex multi-separation system of Parker for modifying the relatively simple process of Lee et al.

Combination Of References

The above discussion demonstrates that a refinery engineer of ordinary skill would not find it obvious to combine the teachings of Parker with the teachings of Lee et al. because of the differences in feedstocks and the different problems that are addressed: one for removing gum-

like compounds from pyrolysis gasolines and the other the removal of sulfur-containing compounds from FCC gasolines.

Points In The Office Action

Referring to page 5 of the Office Action middle paragraph, it is stated that it would have been obvious to replace the nickel catalyst of Parker with a group VIB metal catalyst. Applicants do not replace the nickel catalyst but instead add a VIB so as to form a bimetallic catalyst as clarified in claim 4 and supported by page 6 last line of the specification.

With respect to page 5 second complete paragraph from the bottom, Applicants strongly but respectfully disagree that pyrolysis gasolines and FCC gasolines are so similar that it would be obvious to use one instead of the other -- for the reasons set forth above.

As for other comments in the Office Action, Applicants do not necessarily acquiesce to the correctness of any such statements and reserve the right to rebut such statements at a later date if ever necessary.

In view of the amendments to the claims, the submission of new claims and the above remarks, favorable reconsideration is courteously requested. If there are any issues which can be expeditiously resolved by a telephone conference so as to provide allowable subject matter, the Examiner is courteously invited to telephone Counsel at the number indicated below. Counsel, however, will be absent from the office from July 30th to September 7th. Consequently, the Examiner may contact Mrs. Richardson, Counsel's assistant at 703-812-5326, and she will be happy to involve another attorney so that the Examiner can expeditiously dispose of the application.

The Commissioner is hereby authorized to charge any fees associated with this response or credit any overpayment to Deposit Account No. 13-3402.

Respectfully submitted,


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